

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

(NOTE.—The above section will be resumed in the next issue of the REVIEW.—EDITOR.)

551.590.2

SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING
DECEMBER, 1929

By HERBERT H. KIMBALL, Solar Radiation Investigations

For reference to descriptions of instruments and exposures and an account of the method of obtaining and reducing the measurements the reader is referred to this volume of the REVIEW, page 26.

Table 1 shows no important departures from normal solar radiation intensities for December.

Table 2 shows a deficiency in the total solar radiation received on a horizontal surface directly from the sun and diffusely from the sky at Washington, Madison, and Lincoln, and an excess at Chicago and New York, as compared with the normal amount received at the respective stations in December.

For the year these stations have recorded the percentage departures from their respective average yearly totals given in the last line of the table.

No skylight-polarization measurements were obtained at Madison during the month. At Washington measurements obtained on three days give a mean of 52 per cent and a maximum of 64 per cent on the 21st. The maximum value is an average maximum for December at Washington, but the mean is considerably below the December normal.

TABLE 1.—Solar radiation intensities during December, 1929

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance											Local mean solar time
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon	
	75th mer. time	Air mass										
		A. M.					P. M.					
		e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	
Dec. 3.....	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
Dec. 4.....	1.52	0.61	0.75	0.98	0.98	1.18	1.04	0.88	0.77	1.88	2.87	
Dec. 20.....	1.78	0.84	0.95	1.14	1.32	1.01	1.01	0.88	0.77	1.45	1.88	
Dec. 21.....	1.52	0.95	1.04	1.16	1.32	1.10	1.01	0.92	0.81	1.32	1.45	
Dec. 31.....	4.37	0.85	0.94	1.03	1.32	1.10	0.92	0.81	0.77	1.32	4.57	
Means.....		0.81	0.92	1.08	1.20	1.00	0.81	(0.77)				
Departures.....		+0.03	+0.03	+0.04	-0.03	-0.03	-0.10	-0.02				

¹ Extrapolated.

TABLE 1.—Solar radiation intensities during December, 1929—Con.

Madison, Wis.

Date	Sun's zenith distance										Local mean solar time	
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		Noon
	75th mer. time	Air mass										
		A. M.					P. M.					
		e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0		5.0
Dec. 4.....	<i>mm.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>mm.</i>	
Dec. 5.....	1. 32			1. 10				1. 03			1. 88	
Dec. 30.....	3. 15			1. 02				1. 13			3. 81	
Means.....	3. 15							1. 20			4. 37	
Departures.....				(1. 06)				1. 12				
				-0. 15				+0. 13				

Lincoln, Nebr.

Dec. 2.....	1.02	0.97	1.09	1.22	1.43	1.68		1.22	1.12	1.02	1.19
Dec. 4.....	3.30	0.83	0.92	1.11				1.13	1.01		4.17
Dec. 19.....	0.64	0.97	1.11	1.25				1.18	1.07	0.96	0.86
Dec. 23.....	1.45		0.83	1.02							2.62
Dec. 25.....	2.62								1.01	0.91	3.81
Dec. 27.....	3.81	1.02	1.10	1.21				1.16	1.02		4.17
Dec. 28.....	3.30	1.01	1.11	1.23				1.25	1.11	1.02	2.87
Dec. 30.....	3.00	0.94	0.95	1.23				1.26	1.11	1.04	3.45
Means.....		0.96	1.02	1.18	(1.43)			1.20	1.06	0.99	
Departures.....		+0.01	-0.04	-0.04	+0.05			+0.01	-0.01	+0.03	

TABLE 2.—Solar and sky radiation received on a horizontal surface

[Gram-calories per square centimeter of horizontal surface]

Week beginning	Average daily radiation								Average daily departure from normal				
	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Fresno	La Jolla	Washington	Madison	Lincoln	Chicago	New York
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
1929	195	105	154	103	170	132	192	211	+47	-18	-18	+31	+69
Dec. 3.....	99	33	56	27	89	78	179	208	-38	-80	-102	-41	-7
Dec. 10.....	119	118	196	80	97	134	130	244	-22	-6	+24	+8	-2
Dec. 17.....	126	106	194	117	115	203	107	227	-16	-22	+14	+38	+11
Dec. 24.....													
Excess or deficiency at end of year.....									+5,773	-1,562	-4,948	+248	-5,988
Percentage departures from average totals for the year.....									+4.7	-1.3	-3.6	+0.3	-6.3

¹ 4-day mean.² 8-day period.